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# NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA



# GB/T 17215.302-2024

Replacing GB/T 17215.302-2013

## Electricity metering equipment (AC) - Particular requirements - Part 2: Static harmonic meters for active energy

电测量设备（交流） 特殊要求 第2部分：静止式谐波有功电能表

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## Foreword

This document is in accordance with the provisions of GB/T 1:1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting: This document is Part 2 of GB/T 17215:3 "Particular requirements for electrical measuring equipment (AC)": GB/T 17215:3 has been published: The following parts:

--- Part 1: Multifunctional electric energy meter;

--- Part 2: Static harmonic active energy meter;

--- Particular requirements for alternating current measuring equipment - Part 3: Digital energy meters;

--- Particular requirements for AC current measuring equipment - Part 4: Static energy meters connected via electronic transformers;

--- Particular requirements for AC current measuring equipment - Part 11:

Electromechanical active energy meters (classes 0:5, 1 and 2);

--- Part 21: Static active energy meters (Class A, Class B, Class C, Class D and Class E);

--- Part 23: Static reactive energy meters (level 2 and 3);

--- Part 24: Static fundamental component reactive energy meters (0:5S, 1S, 1, 2 and 3);

--- Particular requirements for alternating current measuring equipment - Part 52: Symbols: This document replaces GB/T 17215:302-2013 "Particular requirements for alternating current measuring equipment Part 2: Static harmonic active current Compared with GB/T 17215:302-2013, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

a) Added the terms and definitions of fundamental wave active energy, single harmonic active energy, positive harmonic active energy, and reverse harmonic active energy (see 3:2, 3:3, 3:4 and 3:5);

b) Deleted "Classification of Instruments" (see 4:2 of the:2013 edition);

c) The original active energy accuracy levels in the entire document have been changed: Level 2, Level 1, Level 0:5S, and Level 0:2S, respectively from Level A, Level B, C and D are replaced, and the new accuracy level E is added (see 4:5, 4:2:3 of the:2013 edition);

d) Added "Instrument identification and documentation" (see Chapter 6);

## 1 Scope

China's national requirements for static meters that measure the active energy carried by harmonics, separately from the energy at the fundamental frequency. It specifies the standard electrical values, the structure, the instrument marking and documentation, and the metrological performance requirements and tests for harmonic active energy meters. Ordinary meters measure total active energy and are calibrated on a clean sinusoid. That was adequate while loads were linear, and it no longer is: variable speed drives, rectifiers, LED lighting, arc furnaces, welding plant and solar inverters all draw non-sinusoidal current, and the harmonic components carry real power in both directions. Harmonic power flowing from the network into a distorting load is energy the customer consumed. Harmonic power flowing from the load back into the network is a pollutant that heats transformers and cables, trips capacitor banks and is paid for by everyone else. Separating the two is a precondition for charging for distortion at all, and the meter that does it needs its own standard, because the general accuracy standards define error against a sinusoid and say nothing about how a meter must behave with a distorted waveform. This part fixes the fundamental voltage, current and frequency values, the power consumption of the meter itself, and the accuracy classes; it defines the reference conditions - which for a harmonic meter must include the spectrum applied, since accuracy has no meaning without stating what waveform it was measured on - and the accuracy requirements and the tests that

demonstrate them. Issued on 25 April 2024 and in force since 1 November 2024, it replaces GB/T 17215.302-2013.

This document specifies the standard electrical value, structure, identification and documentation, metrology of static harmonic active energy meters (hereinafter referred to as "meters"): Energy, climate, external influences, metrological performance protection and electrical requirements, and describes the corresponding test methods: This document applies to newly manufactured meters for use in 50Hz or 60Hz power grids with a voltage not exceeding 600V and is only applicable to For its type test:

## 2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document: For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document:

GB/T 4365-2003 Electrical terminology - Electromagnetic compatibility

GB/T 17215:211-2021 Electrical measuring equipment (AC) General requirements, tests and test conditions Part 11: Measuring equipment

GB/T 17215:321-2021 Electrical measuring equipment (AC) Particular requirements Part 21: Static active energy meters (Class A, B, C, D and E)

## 3 Terms and definitions

The terms and definitions defined in GB/T 4365-2003 and GB/T 17215:211-2021 and the following apply to this document: 3:

1 An instrument for measuring the fundamental wave active electric energy and the specified (sum) 2nd to (nth) harmonic active electric energy: 3:

2 The active power generated by the fundamental wave is integrated over time: 3:

3 The active power generated by a single harmonic is integrated over time: 3:

4 The active power generated by positive harmonics is integrated over time: 3:

5 The active power generated by the opposite harmonics is integrated over time: